

Ceramalux™ High Pressure Sodium Lamp Family



Ideal for...

- Roadways
- Warehouses
- Security lighting
- Industrial applications



■ **Alto** HPS

Passes EPA's TCLP* test for non-hazardous waste

■ **Comfort** HPS

For improved color rendering

■ **RetroLux** HPS

Replace Mercury Vapor with energy efficient HPS; operates on mercury vapor ballast

■ **Instant Restrike** HPS

Dual arc-tube offers 40,000 hours rated life. Extra arc-tube provides light instantly after momentary power interruption.



■ **HPS-RetroWhite**™

Best Metal Halide lamp designed to operate on HPS ballast. Replace yellow light with crisp, bright white light with just a simple twist!

* Toxic Characteristic Leaching Procedure

Philips
Lighting
Company



PHILIPS

Let's make things better.

Ceramalux™ High Pressure¹ Sodium Lamps: Low Total Cost of Ownership; High Efficacy up to 140 LPW; Long Life — Up to 24,000 hours; ALTO® Lamp Technology passes EPA's TCLP test for non-hazardous waste.

Watts	Bulb	Base	Product Number 046677-	Ordering Code	ANSI Code/ Ballast	Pkg. Qty.	Description (Operating Position—Universal unless otherwise indicated)	L.C.L. (In.)	M.O.L. (In.)	Rated Avg. Life Hrs.(351)	Approx. Lumens(352):		CRI	CCT (K)
											Initial	Mean(353)		
35	ED-17, 52V	Med.	30632-4	C35S76/M	S76HA-35	12	*G(360)(373)(376)	3 1/16	5 7/16	24,000+	2250	2025	20	2100
			30633-2	C35S76/D/M	S76HB-35	12	*G(360)(373)(376)	N/A	5 7/16	24,000+	2150	1935	20	2100
50	ED-17, 52V	Med.	30336-2	C50S68/M	S68LP-50	12	*G(360)(373)(376)	3 7/16	5 7/16	24,000+	4000	3600	21	2100
			30337-0	C50S68/D/M	S68LR-50	12	*G(360)(373)(376)	N/A	5 7/16	24,000+	3800	3420	21	2100
	ED-23 1/2, 52V	Mog.	33153-8	C50S68/ALTO	S68MS-50	12	*G,S(360)(373)(376)	5	7 3/4	24,000+	4000	3600	21	2100
			33154-6	C50S68/D/ALTO	S68MT-50	12	*G,S(360)(373)(376)	N/A	7 3/4	24,000+	3800	3420	21	2100
70	ED-17, 52V	Med.	33192-6	C70S62/M	S62LG-70	12	*G(360)(373)(376)	3 7/16	5 7/16	24,000+	6300	5670	21	2100
			33214-8	C70S62/D/M	S62LH-70	12	*G(360)(373)(376)	N/A	5 7/16	24,000+	5860	5270	21	2100
	ED-23 1/2, 52V	Mog.	36869-6	C70S62/ALTO	S62ME-70	12	*G,S(360)(373)(376)	5	7 3/4	24,000+	6300	5670	21	2100
			33225-4	C70S62/D/ALTO	S62MF-70	12	*G,S(360)(373)(376)	N/A	7 3/4	24,000+	5860	5270	21	2100
	PAR-38	Med.	30620-9	C70S62/RFL	S62SL-70	12	*G,VW,50(360)(373)	N/A	5 19/16	16,000	4400	N/A	21	2100
100	ED-17, 55V	Med.	34446-5	C100S54/M	S54SG-100	12	*G(360)(373)(376)	3 1/2	5 7/16	24,000+	9500	8550	21	2100
			34448-1	C100S54/D/M	S54SH-100	12	*G(360)(373)(376)	N/A	5 7/16	24,000+	8800	7920	21	2100
	ED-23 1/2, 55V	Mog.	36872-0	C100S54/ALTO	S54SB-100	12	*G,S(360)(373)(376)	5	7 3/4	24,000+	9500	8550	21	2100
			33227-0	C100S54/D/ALTO	S54MC-100	12	*G,S(360)(373)(376)	N/A	7 3/4	24,000+	8800	7920	21	2100
150	ED-17, 55V	Med.	30347-9	C150S55/M	S55RN-150	12	*G(360)(373)(376)	3 1/2	5 7/16	24,000+	16,000	14,400	21	2100
			30348-7	C150S55/D/M	S55RP-150	12	*G(360)(373)(376)	N/A	5 7/16	24,000+	15,000	13,500	21	2100
	ED-23 1/2, 55V	Mog.	36874-6	C150S55/ALTO	S55SC-150	12	*G,S(360)(370)(373)(376)	5	7 3/4	24,000+	16,000	14,400	21	2100
			33228-8	C150S55/D/ALTO	S55MD-150	12	*G,S(360)(370)(373)(376)	N/A	7 3/4	24,000+	15,000	13,500	21	2100
ED-28, 100V	Mog.	36876-1	C150S56/ALTO	S56SD-150	12	*G,S(360)(370)(373)(376)	5	8 5/16	24,000+	16,000	14,400	21	2100	
200	ED-18, 100V	Mog.	36877-9	C200S66/ALTO	S66MN-200	12	*G,S(360)(373)(376)	5 3/4	9 3/4	24,000+	22,000	19,800	21	2100
225	ED-18, 100V	Mog.	32291-7	C225S50/EW	S50	12	*EW,G,S(360)(373)	5 3/4	9 3/4	24,000+	27,500	24,800	21	2100
			33173-6	C250S50/D/ALTO	S50VC-250	12	*G,S(360)(373)(376)	N/A	8 5/16	24,000+	26,000	24,300	21	2100
310	ED-18, 100V	Mog.	20226-7	C310S67	S67MR-310	12	*G,S(360)(373)(376)	5 3/4	9 3/4	24,000+	37,000	33,300	21	2100
360	ED-18, 84V	Mog.	32292-5	C360S51/EW	S51	12	*EW,G,S(360)(373)(376)	5 3/4	9 3/4	24,000+	47,500	42,800	25	2100
400	ED-18, 100V	Mog.	36881-1	C400S51/ALTO	S51WA-400	12	*G,S(360)(373)(376)	5 3/4	9 3/4	24,000+	50,000	45,000	21	2100
			34602-3	C400S51/D/ALTO	S51WB-400	6	*G,S(360)(373)(376)	N/A	11 1/2	24,000+	47,500	42,750	21	2100
430	ED-18	Mog.	31710-7	SON AGRO 430W	S51	12	*AGRO(360)(373)(389)(396)	5 3/4	9 3/4	16,000	53,000	47,700	21	2100
600	T-14	Mog.	23982-2	C600S106	S106	12	*G(360)(373)(376)	6 7/8	11 1/8	24,000+	90,000	81,000	21	2100
1000	ED-37, 250V	Mog.	32386-5	C1000S52/ED37	S52	6	*G,S(360)(373)(376)	7	11 1/2	24,000+	125,000	112,000	21	2100
			36883-7	C1000S52/ALTO	S52XB-1000	6	*G,S(359)(360)(362)(373)(376)	8 3/4	15 1/16	24,000+	140,000	126,000	21	2100

Ceramalux Comfort High Pressure¹ Sodium Lamps⁴—Improved Color Rendition of 60–65 CRI; Warm White Color Appearance; High Efficacy; Operates on Standard HPS Ballasts.

70	ED-17, 52V	Med.	30617-5	C70S62/C/M	S62LG-70/C	12	*G(360)(373)(376)	3 1/16	5 7/16	15,000	4400	3960	60	2200
			30621-7	C70S62/C/D/M	S62LH-70/C	12	*G(360)(373)(376)	N/A	5 7/16	15,000	4180	3760	60	2200
	ED-23 1/2, 52V	Mog.	30615-9	C70S62/C	S62ME-70/C	12	*G(360)(373)(376)	5	7 3/4	15,000	4400	3960	60	2200
100	ED-17, 55V	Med.	30635-7	C100S54/C/M	S54SG-100/C	12	*G(360)(373)(376)	3 7/16	5 7/16	15,000	7300	6570	60	2200
			30637-3	C100S54/C	S54SB-100/C	12	*G(360)(373)(376)	5	7 3/4	15,000	7300	6570	60	2200
	ED-23 1/2, 55V	Mog.	30636-5	C100S54/C/D	S54MC-100/C	12	*G(360)(373)(376)	N/A	7 3/4	15,000	6940	6250	60	2200
150	ED-17, 55V	Med.	30647-2	C150S55/C/M	S55RN-150/C	12	*G(360)(373)(376)	3 7/16	5 7/16	15,000	12,000	10,800	60	2200
			30644-9	C150S55/C/D/M	S55RP-150/C	12	*G(360)(373)(376)	N/A	5 7/16	15,000	11,000	9900	60	2200
	ED-23 1/2, 55V	Mog.	30643-1	C150S55/C	S55SC-150/C	12	*G(360)(373)(376)	5	7 3/4	15,000	12,000	10,800	60	2200
250	ED-18, 100V	Mog.	30245-5	C250S50/C	S50VA-250/C	12	*G(360)(373)(376)	5 3/4	9 3/4	15,000	23,000	20,700	65	2200
400	ED-18, 100V	Mog.	30652-2	C400S51/C	S51WA-400/C	12	*G(360)(373)(376)	5 3/4	9 3/4	15,000	37,500	33,750	65	2200

Instant Restrike High Pressure¹ Sodium Lamps: Extra Arc Tube Offers Light Instantly After Momentary Power Interruption; Will Provide 80% Light Output Within 1–2 Minutes; For Applications Where Instant Restrike is not Required, Rated Lamp Life is 40,000 Hours; Operates on Standard HPS Ballasts and Auxiliary Equipment.

50	ED-23 1/2, 52V	Mog.	35467-0	C50S68/2	S68	12	*G,S(360)(373)(376)	5	7 3/4	24,000+ ³	3800	3450	21	2100
70	ED-23 1/2, 52V	Mog.	26541-3	C70S62/2	S62	12	*G,S(360)(373)(376)	5	7 3/4	24,000+ ³	5600	5050	21	2100
100	ED-23 1/2, 55V	Mog.	26560-3	C100S54/2	S54	12	*G,S(360)(373)(376)	5	7 3/4	24,000+ ³	9100	8190	21	2100
150	ED-23 1/2, 55V	Mog.	26561-1	C150S55/2	S55	12	*G,S(360)(373)(376)	5	7 3/4	24,000+ ³	15,600	14,000	21	2100
250	ED-18, 100V	Mog.	37717-6	C250S50/2	S50VJ-250	12	*G,S(360)(373)(376)	5 3/4	9 3/4	24,000+ ³	27,500	24,750	21	2100
400	ED-18, 100V	Mog.	37688-9	C400S51/2	S51WG-400	12	*G,S(360)(373)(376)	5 3/4	9 3/4	24,000+ ³	49,000	44,000	21	2100
1000	E-25, 250V	Mog.	20412-3	C1000S52/2	S52	6	*G,S(360)(373)(376)	8 3/4	15 1/16	24,000+ ³	140,000	126,000	21	2100

Ceramalux RetroLux High Pressure¹ Sodium Lamps: For Operation on All Mercury Vapor and Metal Halide Ballasts of Similar Wattage². 150W retrofits 175 watt Mercury Vapor (ANSI H39) or Metal Halide (ANSI M57); 215W retrofits 250 watt Mercury Vapor (ANSI H37) or Metal Halide (ANSI M58); 360W retrofits 400 watt Mercury Vapor (ANSI H33) or Metal Halide (ANSI M59).

150	ED-28	Mog.	31142-3	C150S63/RetroLux	S63		*G,S	5	8 5/16	24,000	15,000	13,500	25	1900
215	ED-28	Mog.	31144-9	C215S65/RetroLux	S65		*G,S	5	8 5/16	24,000	23,000	20,700	25	1900
360	ED-37	Mog.	31145-6	C360S64/RetroLux	S64		*G,S	7	11 1/2	24,000	45,000	40,500	25	1900

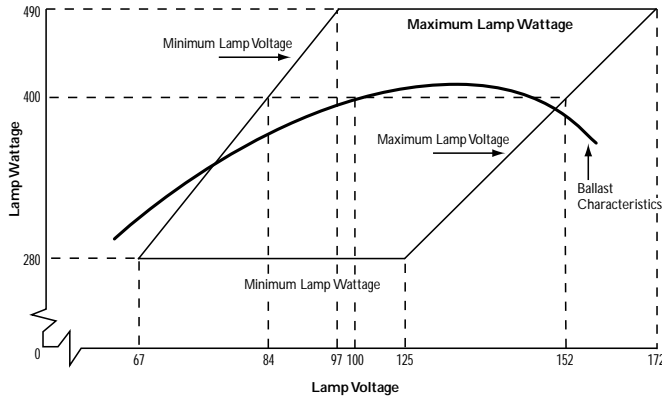
Ceramalux High Pressure¹ Sodium Family

Electrical, Technical and Ordering Data (Subject to change without notice)

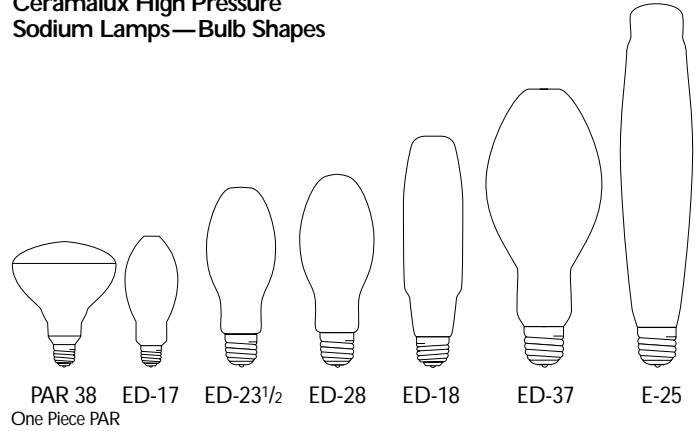
Operating Position	Universal
Bulb Temperature (Maximum)	400°C
Mogul Base Temperature (Maximum)	210°C
Lamp Current Crest Factor (Maximum)	1.8
Warm-up Time to 80% Full Light Output	3-4 Minutes
Restart Time for Hot Lamps	15 Minute
(Except Instant Restrike Lamps, which restart instantaneously)	
Starter Pulse Voltage—Peak	2500 Min., 4000 Max. ⁽³⁶⁰⁾ (373)(376)

Pulse Width @ 90% Peak	1 Micro-Second Minimum	
Pulse Repetition Rate (Minimum)	Lag Ballast	1 Per Cycle
Lead Ballast	1 Per 1/2 Cycle	
Minimum Operating Temperature	-30°C (-22°F)	
Standard Package Quantity	12	
(Except ED-37 & E-25 Lamps, which are 6)		

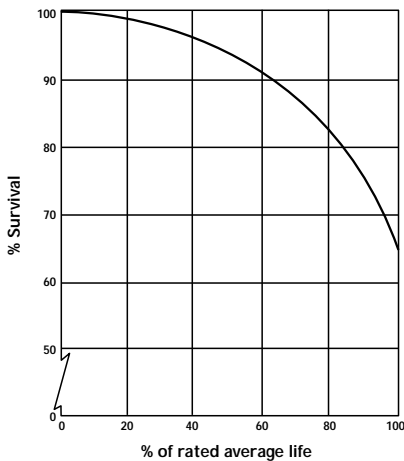
Trapezoid Diagram for a 400 Watt Lamp Showing Voltage/Wattage Operating Limits



Ceramalux High Pressure Sodium Lamps—Bulb Shapes

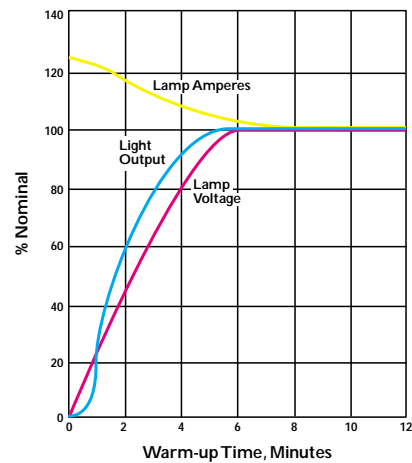


Approximate Survival Curve, HPS Lamps*

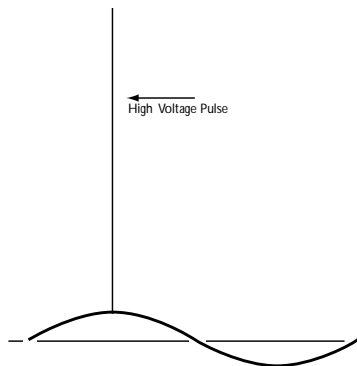


* For lamps with rated average life of 24,000+ hours.

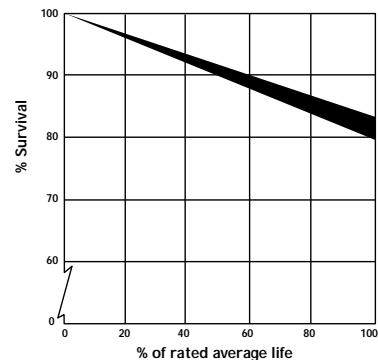
Warm-up Characteristics, HPS Lamps



Pulse Voltage for Starting HPS Lamps



Approximate Lumen Maintenance, HPS Lamps*



* For lamps with rated average life of 24,000+ hours.

FOOTNOTES

- ★ — Heat resisting glass bulb
- AGRO — Agro-Lite Plant Light
- EW — Econ-o-watt™
- G — General Lighting
- S — Street Lighting
- VW — Very Wide Beam

(1) The "high" pressure is less than atmospheric and is entirely within the arc tube. The outer bulb is evacuated. The silver spot near the lamp base is "getter" used in evacuating the bulb to ensure long life. (2) For operation on all mercury vapor and metal halide ballasts of the appropriate ANSI designations, designed for an individual lamp. Operating position: universal. (3) Where instant restrike is not required, rated

life is 40,000 hours. (4) Ceramalux COMFORT HPS lamps operate on all ballasts meeting the appropriate ANSI standards. For maximum color uniformity lamp to lamp over life, as well as life uniformity, Regulated Lag or equivalent type ballasts are recommended. (351) Rated average life is obtained, on the average, from large representative groups of lamps in laboratory test under controlled conditions at 10 or more oper-

ating hours per start. It is based on survival of at least 50% of the lamps and allows for individual lamps or groups of lamps to vary considerably from the average. For lamps with a rated average life of 24,000 hours, life is based on survival of 67% of the lamps. (352) Based on photometry of 100-hour lamps in vertical positions at rated watts on a linear reactor ballast under specified test conditions; however, ratings

apply to all operating positions. (353) Approximate lumen output at 50% of rated lamp life. (359) Electrically insulated support for bulb may be required, especially in horizontal and nearly horizontal operating positions. (360) Follow fixture manufacturer's recommendations regarding proximity of ballast to bulb. (362) This lamp should be shielded from moisture to prevent breakage. (370) C150555

and C150556 lamps are not electrically interchangeable. Different ballasts are required for the proper operation of each lamp type. ANSI type S55 ballast is for the 55-volt (nominal) lamp and the ANSI type S56 ballast is for the 100 volt (nominal) lamp. (373) The lamp ballast must provide a minimum starting voltage pulse of 2500V (3500V for the 1000 watt lamp), therefore fixtures designed for these lamps must

incorporate socket designs and wiring capable of withstanding such voltages without arc-over (up to 5000V for 1000 watt lamp). (376) For use in fixtures which do not redirect a substantial portion of the energy toward the arc tube or the lamp "getter"; otherwise very early failure is anticipated. (389) Operates at rated output on ANSI 400W S51 ballasts. (396) UV filtered design (FadeBlock™).

MasterColor® HPS-RetroWhite™

HPS-RetroWhite is designed to operate on HPS Ballasts. It uses ALTO® Lamp Technology, which means it passes the EPA's TCLP Test for non-hazardous waste.

- Replace yellow light with crisp, bright white light with just a simple twist
- 85%+ Lumen Maintenance
- No Shut Off Required in 24 hour/7 days-a-week operations
- Patent-Pending Coil Design Offers Protection for Open Fixture Rating

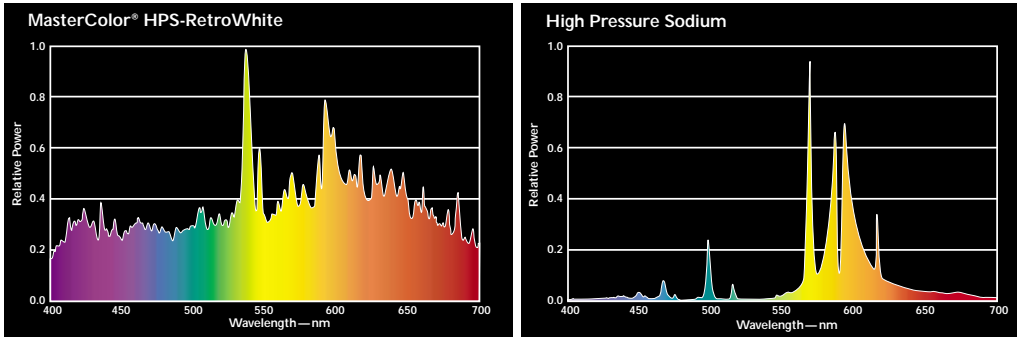
Watts	Bulb	Base	Product Number 046677-	Ordering Code	ANSI Code/ Ballast	Pkg. Qty.	Description	L.C.L. (In.)	M.O.L. (In.)	Rated Avg. Life Hrs.(351)	Approx. Lumens (352): Initial Mean (353)	CRI	CCT (K)
250	ED-18	Mog.	38628-4	CDM250S50/V/O/4K	S50/O	12	*G(360)	5¾	9¾	20,000	22,500 19,125	90	4000
400	ED-18	Mog.	38627-6	CDM400S51/V/O/4K	S51/O	12	*G(360)	5¾	9¾	20,000	36,000 30,600	90	4000

MasterColor HPS-RetroWhite Electrical, Technical and Ordering Data (Subject to change without notice)

Operating Position	Vertical ± 15%	Restart Time for Hot Lamps	15 Minutes
Fixture Rating	Open or Enclosed	Starter Pulse Voltage—Peak	2500 Min., 4000 Max.
Bulb Temperature (Maximum)	400°C	Pulse Width @ 90% Peak	1 Micro-Second Minimum
Base Temperature (Maximum)	210°C	Pulse Repetition Rate (Minimum)	1 Per 1/2 Cycle
Lamp Current Crest Factor (Maximum)	1.8	Minimum Operating Temperature	-30°C (-22°F)
Warm-up Time to 80% Full Light Output	2 Minutes	Standard Package Quantity	12

- (1) Average life under specified test conditions with lamps turned off and restarted once every eleven operating hours. V = Vertical operation ± 15°
 (2) Values for vertical operation of lamp. ANSI Code: O = Open fixture rated
 (3) Approximate lumens at 40% of rated average life (8000 hours). ★ Heat Resisting Glass Bulb
 (360) Follow fixture manufacturer's recommendations regarding proximity of ballasts to bulbs. G = General Lighting

MasterColor HPS-RetroWhite vs. Standard HPS Spectral Power Distribution



WARNINGS, CAUTIONS AND OPERATING INSTRUCTIONS FOR MASTERCOLOR HPS-RETROWHITE

“WARNING: These lamps can cause serious skin burn and eye inflammation from short wave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. Certain lamps that will automatically extinguish when the outer envelope is broken or punctured are commercially available.” This lamp complies with FDA radiation performance standard 21 CFR subchapter J. (USA:21CFR 1040.30 Canada: SOR/DORS/80-381)

If the outer bulb is broken or punctured, turn off at once and replace the lamp to avoid possible injury from hazardous short wave ultraviolet radiation. Do not scratch the outer bulb or subject it to pressure as this could cause the outer bulb to crack or shatter. A partial vacuum in the outer bulb may cause glass to fly if the envelope is struck. WARNING: The arc-tube of metal halide lamps are designed to operate under high pressure and at temperatures up to 1000° C and can unexpectedly rupture due to internal or external factors such as a ballast failure or misapplication. If the arc-tube ruptures for any reason, the outer bulb may break and pieces of extremely hot glass might be discharged into the surrounding environment. If such a rupture were to happen, THERE IS A RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE. These lamps are designed to retain all the glass particles should an arc tube rupture occur. The following operating instructions are recommended to minimize these occurrences.

RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE. Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.

This lamp contains an arc tube with a filling gas containing Kr-85 and is distributed by Philips Lighting Company, a division of Philips Electronics North America Corporation, Somerset, New Jersey, 08875.

CAUTION: TO REDUCE THE RISK OF PERSONAL INJURY, PROPERTY DAMAGE, BURNS AND FIRE RESULTING FROM AN ARC-TUBE RUPTURE THE FOLLOWING LAMP OPERATING INSTRUCTIONS MUST BE FOLLOWED:

LAMP OPERATING INSTRUCTIONS:

- 1) RELAMP FIXTURES AT OR BEFORE THE END OF RATED LIFE. Allowing lamps to operate until they fail is not advised and may increase the possibility of inner arc tube rupture.
- 2) Before lamp installation/replacement, shut power off and allow lamp and fixture to cool to avoid electrical shock and potential burn hazards.
- 3) Use only auxiliary equipment meeting Philips and/or ANSI standards. Use within voltage limits recommended by ballast manufacturer. A. Operate lamp only within specified limits of operation. B. For total supply load refer to ballast manufacturers electrical data.
- 4) Periodically inspect the outer envelope. Replace any lamps that show scratches, cracks or damage.
- 5) If a lamp bulb support is used, be sure to insulate the support electrically to avoid possible decomposition of the bulb glass.
- 6) Protect lamp base, socket and wiring against moisture, corrosive atmospheres and excessive heat.
- 7) Time should be allowed for lamps to stabilize in color when turned on for the first time. This may require several hours of operation, with more than one start. Lamp color is also subject to change under conditions of excess vibration or shock, and color appearance may vary between individual lamps.
- 8) Lamps may require 10 to 20 minutes to re-light if there is a power interruption.
- 9) Take care in handling and disposing of lamps. If an arc tube is broken, avoid skin contact with any of the contents or fragments.